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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/543,080
Filing Date: July 21, 2005
Appellant(s): PONTANARI ET AL.

Pontanari et al.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/5/2009 appealing from the Office action mailed 9/5/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5030181	Keller	7-1991
6886425	Petzold	5-2005

4561520

Fogelberg

12-1985

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 12-20, 24, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **KELLER (US 5,030,181)** in view of **PETZOLD (US 6,886,425)**.

A portion of Fig. 1 from **KELLER** has been reproduced below with added reference characters. **KELLER** discloses a drive axle assembly with a locking differential comprising: a driving input (A) defining a longitudinal axis; a carrier (C) including a pinion gear (B) driven by said driving input and a ring gear (24) in meshing engagement with said pinion gear; a differential including a differential gear assembly supported by a differential case (comprised of the ring gear (24) and the carrier (C)) wherein said ring gear is attached to said differential case (because it is integrally formed) to drive said differential gear assembly; a pair of axle shafts (1) driven by said differential gear assembly for rotation about a lateral axis, said lateral axis being transverse to said longitudinal axis; a locking mechanism including a shift collar (18) and an electronic actuator (16) for controlling movement of said shift collar wherein said shift collar is movable between an unlocked position where speed differentiation

between said pair of axle shafts is permitted and a locked position, and wherein said shift collar is moved into locking engagement with said differential case in response to an electronic signal such that said differential case, said shift collar and said pair of axle shafts are fixed for rotation together about said lateral axis, and wherein said electronic actuator comprises a coil (16) surrounding said shift collar wherein said electronic signal powers said coil to move said shift collar; wherein said shift collar includes an inboard end having a splined surface (21) and an outboard end, said inboard end having a greater diameter than said outboard end and wherein said coil defines a central bore surrounding said shift collar at said outboard end, said shift collar moving in an inboard direction in response to said coil being powered via said electronic signal such that said splined surface of said inboard end engages a mating splined surface (22) formed on said differential case such that said differential case is locked to said pair of axle shafts; an axle housing (2) for substantially enclosing said carrier and said pair of axle shafts wherein said coil is supported by said axle housing; and a resilient member (26) for automatically returning said shift collar to said unlocked position when said coil is not powered.

The differential case includes a first case half (C) and a second case half (24) attached to the first case half and wherein said electronic actuator selectively draws said shift collar into direct engagement with one of said first and second case halves.

A pair of side gears (D,E) with one side gear being fixed to each of said pair of axle shafts and wherein said differential gear assembly includes a differential spider (F) having four support shafts orientated in an overall shape of a cross and four differential

pinion gears (G) in meshing engagement with said side pair of gears with one of said four differential pinion gears being supported on each of said four support shafts and wherein said ring gear is fixed to one of said first and second case halves such that said ring gear, said differential case, said differential spider, and said four differential pinion gears all rotate as one unit to transfer power to said pair of axle shafts via said pair of side gears when no speed differentiation is required and when speed differentiation is required said four differential pinion gears rotate on respective support shafts to speed up rotation of one of said pair of axle shafts via a respective one of said pair of side gears while slowing rotation of the other of said pair of axle shafts via a respective other of said pair of side gears.

One of said pair of axle shafts (1) includes a set of inboard splines (H) and a set of outboard splines (I), said set of inboard splines cooperating with said respective one of said pair of side gears to fix said one of said pair of side gears for rotation with said one of said pair of axle shafts and said set of outboard splines cooperating with a splined bore formed inside said inboard end of said shift collar.

The shift collar includes an inboard end (21) that engages the differential case and an outboard end (adjacent member (13)) that has a smaller diameter than the inboard end, and including fixing a washer (19) to the outboard end of the shift collar, and positioning the coil axially between the inboard end (21) and the washer (19).

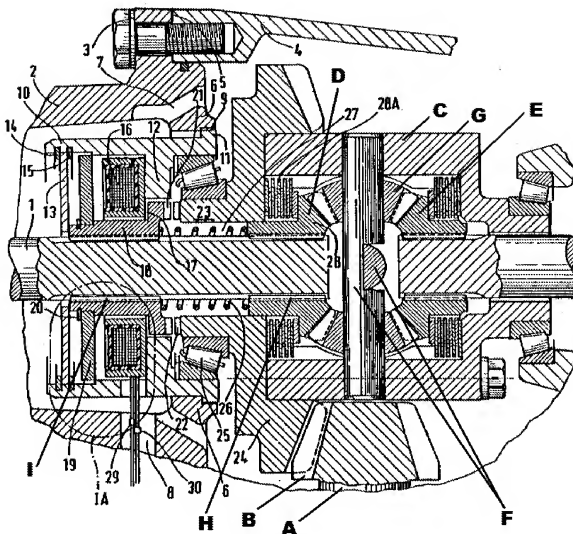


Figure 1: Taken from Figure 1 of KELLER (US 5,030,181)

KELLER does not disclose the resilient member surrounding an outer end portion of the shift collar and reacting between the coil and a washer mounted to the outboard end of the shift collar.

PETZOLD teaches an electromagnetic shift arrangement wherein a resilient member (46) surrounds an outer end portion (44) of a shift collar (18) and the resilient member reacts between a coil (40) and a washer (22) mounted to the shift collar.

Both Keller and Petzold teach methods of biasing a shift collar that is electromagnetically actuated, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute one method for the other to achieve the predictable result of biasing the shift collar.

Claims 11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over **KELLER (US 5,030,181)** in view of **PETZOLD (US 6,886,425)** as applied to claims 1-10, 12-20, 24, 25 and 27 above, and further in view of **FOGELBERG (US 4,561,520)**.

The combination of KELLER-PETZOLD discloses a differential locking mechanism with an electronic actuator including a coil that is attached to the housing.

The combination of KELLER-PETZOLD does not disclose the coil having mounting portions the receive fasteners to connect the coil to the housing.

FOGELBERG teaches a coil (48) attached to a housing (12) by the use of fasteners (not numbered).

Both the combination of KELLER-PETZOLD and FOGELBERG teach methods of retaining a coil in a housing, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute one method for the other to achieve the predictable result of retaining the coil in the housing.

(10) Response to Argument

Claim 1

Applicant argues:

1) Keller does not disclose direct engagement between a differential case and shift collar.

2) There is no motivation or suggestion to modify Keller in the manner proposed by the Examiner.

3) Keller teaches away from positioning the spring in the manner proposed by the Examiner because, Keller states that the spring is arranged between the sliding sleeve 18 and the opposing hub collar 23 to ensure that when no current is flowing through the magnet that the drive gears will not accidentally engage.

4) Keller teaches away from positioning the spring in the manner proposed by the Examiner because, the arrangement of the drive gears radially outside of the springs facilitates the concentric installation of a single spring of the shaft and the use of a particularly short sliding sleeve is made possible. See col. 2, line 66 through col. 3, line 2.

5) Keller also teaches a beneficial configuration (see Figure 1A) that minimizes an air gap 32 between armature and the magnet that facilitates starting and saves electricity. See col. 5, lines 1-16. The examiner's proposed modification would clearly defeat the beneficial features that are provided by Keller's present spring configuration.

Examiner Disagrees for the following reasons:

1) It is clear that the differential case of Keller is assembled from two pieces, (24) and (C) as shown in Figure above, which is taken from Fig. 1 of the Keller reference and reference letters have been added for clarification.

2) Both resilient members of the two prior art references used in the rejection of claim 1 perform the task of returning the clutch member to the unengaged position. A simple substitution of one known method with another would have been obvious for one of

ordinary skill in the art to try at the time the invention was made because predictable results would have ensued. Also, applicant's arguments as to the EXACT methods that would be used to remove the spring are merely bodily incorporation.

3) Although Keller provides one possible reason for locating the spring (26) in a position "between the annular collar and the opposite hub" the reference does not expressly state, **NOT** locating the spring in a position between a coil and a washer attached to the collar as disclosed by the applicant and as taught by Petzold. Keller does not provide any indication that rearranging the spring to the position taught by Petzold would render his invention useless or otherwise be an inferior or detrimental design choice. A rearrangement of the resilient member of the Keller patent to a location taught by the Petzold patent only involves routine skill in the art. In re Japikse, 86 USPQ 70. Examiner does not rely on the alternative embodiment Keller shows in Fig. 1A.

4) The arrangement of the spring (46) on the collar (18), as taught by Petzold, and shown in Fig. 2 of his patent '425, clearly discloses the installation of a single spring on the shaft (12) and the use of a particularly short sliding sleeve. Applicant's claims are rejected based on the modification of the Keller reference in view of Petzold. The combination of the two references would still result in the spring being concentrically installed over the shaft. Further, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

5) The configuration Keller discloses in Fig. 1A is an alternative embodiment that is not relied upon in the rejection of applicant's pending claims.

Claims 2-4

Applicant argues:

1) The element 16 of Keller is not a coil mounted to an axle component.

Examiner Disagrees for the following reasons:

1) Keller states the magnet (16) sits against inner annular shoulder (12) (col. 4, lines 36-37). This shoulder is an axle component, as all elements disclosed/ shown in the Keller reference relate to the axle of a vehicle. Also, the cables (29, 30) provide an electrical supply to the magnet (16) (col. 4, lines 67-68), and the invention is referred to as an "electromagnetic clutch/ coupling", therefore the magnet is obviously a coil.

Claim 5

Applicant argues:

1) The disc 33 of the Petzold reference is centrally positioned on the shift dog.

2) Neither reference discloses a spring that reacts between a coil and an outboard end of a shift collar.

Examiner Disagrees for the following reasons:

1 and 2) In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Petzold reference does not need to be relied upon to teach the washer

located on the outboard end of the shift collar as this feature of the claims is disclosed by the base reference, Keller. The modification of the Keller reference, in view of Petzold, would position the spring between the washer (19) and the coil (16), thus meeting the claim limitations.

Claim 6

Applicant argues:

- 1) In Figures 1-2 of Petzold, disc 22 is centrally positioned on the shift dog 18.
- 2) Petzold clearly does not disclose, suggest, or teach fixing a washer to an outboard end of a shift collar to react against a resilient member as claimed.

Examiner Disagrees for the following reasons:

- 1) The disc (22) of the Petzold reference is not "centrally positioned" on the shift collar (18), as argued by the applicant. Fig. 2 of the Petzold reference clearly shows the disc (22) is to the left of center of the collar. The disc/ washer of Petzold is clearly to the left of center of the collar (18) as shown in Fig. 2 of the Petzold reference.
- 2) The reaction force created by the spring (46) would react on the collar (18) through the left side of the disc (22), which is in the outboard direction.

Claim 7 - 8

Applicant argues:

- 1) The sleeve 18 does not have a reduced diameter portion that supports a resilient member.

Examiner disagrees for the following reason:

1) The claim recites "an outboard end **for** supporting said resilient member". This is merely intended use, it describes what the invention does, not what it is. The structure of the sleeve 18 of the Keller reference is such that it is fully capable of supporting a resilient member on its outboard end, which is of a reduced diameter from the inboard end which contains the splines (21).

Claim 9-10 and 17-18

Applicant argues:

- 1) Keller does not disclose a differential having a differential case that is locked to a shift collar.
- 2) Neither the Keller or Petzold references disclose the resilient member surrounding the shift collar and reacting between the electronic actuator and the shift collar
- 3) Keller teaches away from the proposed modification of Keller in view of Petzold

Examiner disagrees for the following reasons:

- 1) The case of Keller is formed in two parts, the ring gear section (24) and the housing section labeled (C) in the Figure below. The shift collar (18) clearly engages the part of the case formed by the ring gear.
- 2) The Petzold reference is used to teach the arrangement wherein the resilient member (46) surrounds the shift collar (18) and discloses the resilient member reacting between the electronic actuator (40) and the shift collar via the disc (22).
- 3) Both reference disclose an invention in which an electromagnetic actuator axially displaces a shift collar, and each uses a spring to return the collar to an unengaged position. By rearranging the location of the spring based on the teachings of one

reference, the function of the modified reference would not be destroyed. The substitution of one return system for another would be known by one of ordinary skill in the art.

Claim 12

Applicant argues:

1) The mounting position of the disc (22) of Petzold is centralized in reference to the shift collar (8)

Examiner disagrees for the following reasons:

1) It is clear that the disc (22) is mounted on the shift collar (18) to the left of center as viewed in Fig. 2 of the Petzold reference.

Claim 13

Applicant argues:

1) There is no motivation or suggestion to modify Keller in the manner proposed by the examiner because Keller teaches away from the proposed modification.

2) Petzold teaches away from the resilient member reacting between the coil and a washer mounted to the outboard end of the shift collar by disclosing a beneficial configuration where a disc 22 is centrally mounted on a shift dog 18.

Examiner disagrees for the following reasons:

1) Both references disclose an invention in which an electromagnetic actuator axially displaces a shift collar, and each uses a spring to return the collar to an unengaged position. The rearranging the location of the spring based on the teachings of one reference, the function of the modified reference would not be destroyed. The

substitution of one return system for another would be known by one of ordinary skill in the art.

2) Fig. 2 of Petzold clearly shows the disc (22) positioned to the left of center on the shift collar (18).

Claims 14-16

Applicant argues:

1) Keller does not disclose direct engagement between a differential case half and a shift collar.

Examiner disagrees for the following reason:

1) The shift collar (18) of Keller engages with the case half formed by the ring gear (24) as shown in Fig. 1 of Keller

Claim 19

Applicant argues:

1) Keller does not disclose direct engagement between a differential case half and a shift collar.

Examiner disagrees for the following reason:

1) The shift collar (18) of Keller engages with the case half formed by the ring gear (24) as shown in Fig. 1 of Keller.

Claim 20

Applicant argues:

1) The location of the disc (22) is not at either end of the shift dog 18. Instead, Petzold teaches a central mounting of disc (22).

Examiner disagrees for the following reason:

1) Fig. 2 of Petzold clearly shows the disc (22) positioned to the left of center on the shift collar (18).

Claim 24

Applicant argues:

- 1) Keller does not disclose the claimed washer.
- 2) Petzold does not disclose a washer that is positioned at an end of a shift collar.
- 3) The shift dog in Petzold is defined by a common diameter at each end.
- 4) The shift dog 18 includes a central notch that receives the disc. Thus, Petzold teaches away from mounting a washer to one end of a shift collar that has a smaller diameter than the end of the shift collar that has the splined surface.

Examiner disagrees for the following reasons:

- 1) Keller discloses a washer (19) fixed to the second end of the shift collar, which is of a smaller diameter than the first end for the shift collar where a splined surface (21) is formed to engage with a mating splined surface (22) of the differential case.
- 2) The washer (22) is positioned to the left of center on the shift collar (18) as can be seen in Fig. 2 of the Petzold reference. Therefore, it is on the left end of the shift collar (18).
- 3) The shift collar of Petzold is not used to teach the variance in diameters as disclosed in the pending claims, the Keller reference is relied upon for this limitation.

4) As discussed above, Petzold shows, in Fig. 2 of his disclosure, the washer (22) positioned to the left of center on the shift collar (18), this is the same arrangement show in Fig. 1 of the Keller patent. There is no teaching away.

Claim 25

Applicant argues:

- 1) None of the references disclose, suggest, or teach the electronic actuator includes a coil that is positioned axially between the first end and the washer.
- 2) None of the references disclose, suggest, or teach the resilient member is positioned axially between the washer and the coil.
- 3) Keller does not disclose a washer and Petzold teaches locating a disc at a central location on a shift dog 18.
- 4) Neither reference discloses a spline surface at one end, a washer fixed to an opposite end, and a resilient member that is positioned between a washer and coil as claimed.

Examiner disagrees for the following reasons:

- 1) Keller clearly shows the coil (16) positioned between the first end (@ 21) and the washer (19). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

2) Petzold clearly teaches the resilient member (46) being positioned between the coil (40) and the washer (22). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

3) Element (19) of Keller is described as "an annular armature plate" (col. 4, line 45). A washer is an annular plate. Element is by definition a washer. Element (19) of Keller is not called a "washer", however this is just a matter of semantics.

4) The Keller reference discloses a spline surface at one end (21), a washer (19) fixed to an opposite end of the collar (18), and the Petzold reference teaches a resilient member (46) that is positioned between the washer (22) and the coil (40). It is the combination of the two reference upon which the claims are rejected. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim 27

Applicant argues:

1) The references do not disclose, suggest, or teach the coil is positioned axially between the inboard end and the washer.

Examiner disagrees for the following reasons:

1) Keller clearly shows in Fig. 1 the coil (16) is positioned axially between the inboard end (@ 21) and the washer (19).

Claim 11

Applicant argues:

- 1) There is no motivation or suggestion to modify Keller in the manner proposed by the examiner.
- 2) Keller teaches away from the examiner's proposed modification.

Examiner disagrees for the following reasons:

1 & 2) Keller discloses the magnet as "sit[ting] against inner annular shoulder 12". Fogelberg teaches securing an electromagnetic coil through the use of fasteners. Keller does not teach away because the reference does not expressly state a problem with mounting the magnet using fasteners. A magnetic coil that is attached to a housing via fasteners is fully capable of being "separately installed as a unit within a housing" as stated in Keller.

Claim 26

Applicant argues:

- 1) There is no motivation or suggestion to modify Keller in the manner proposed by the examiner.
- 2) Keller teaches away from the examiner's proposed modification.

Examiner disagrees for the following reasons:

1 & 2) Keller discloses the magnet as "sit[ting] against inner annular shoulder 12". Fogelberg teaches securing an electromagnetic coil through the use of fasteners. Keller

does not teach away because the reference does not expressly state a problem with mounting the magnet using fasteners. A magnetic coil that is attached to a housing via fasteners is fully capable of being "separately installed as a unit within a housing" as stated in Keller.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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